

WHAT IS CLAIMED IS:

1. A blood parameter measurement system comprising:
  - a monitor configured to provide an oxygen saturation measurement based upon the absorption of two wavelengths of optical radiation by a tissue site;
  - a software upgrade installable in said monitor so as to enable said monitor to operate in conjunction with a multiple wavelength sensor; and
  - a wavelength controller adapted to said upgrade so as to drive said sensor.
2. The blood parameter measurement system according to claim 1 wherein said upgrade comprises:
  - sampling software providing a drive waveform for said sensor; and
  - signal processing software adapted to demodulate a multiplexed signal from said sensor.
3. The blood parameter measurement system according to claim 2 wherein said drive waveform comprises:
  - a header interval that controls said wavelength controller; and
  - an emitter drive interval that enables drive current to said sensor.
4. The blood parameter measurement system according to claim 3 wherein said header interval comprises a sync period decodable by said wavelength controller so as to synchronize said wavelength controller and said upgrade.
5. The blood parameter measurement system according to claim 3 wherein said header interval comprises a command interval decodable by said wavelength controller so as to allow said upgrade to command said wavelength controller.
6. The blood parameter measurement system according to claim 1 wherein said wavelength controller is located in an adapter cable, said adapter cable providing an interface between the sensor port of said monitor and said sensor.

7. The blood parameter measurement system according to claim 1 wherein said wavelength controller is integrated into said sensor.

8. The blood parameter measurement system according to claim 7 wherein said wavelength controller is co-located with multiple LEDs within an emitter component, said emitter component adapted to substitute for a two-wavelength emitter component within a pulse oximetry sensor.

9. The blood parameter measurement system according to claim 1 wherein said wavelength controller comprises:

- a sensor control configured to route a drive signal to a select one of a plurality of sensor emitters; and

- a sync detector adapted to decode a sync interval on said drive signal so as to synchronize the operations of said software upgrade and said wavelength controller.

10. The blood parameter measurement system according to claim 9 wherein said wavelength controller further comprises a command decoder adapted to decode a command interval on said drive signal so as to accept commands from said software upgrade.

11. The blood parameter measurement system according to claim 9 wherein said wavelength controller further comprises a transmitter configured to communicate sensor information to said monitor on conductors that communicate said drive signal.

12. The blood parameter measurement system according to claim 9 wherein said sensor control comprises an output multiplexer that routes said drive signal to selected emitters of said sensor.

13. The blood parameter measurement system according to claim 9 wherein said sensor control comprises:

a plurality of switches configured to connect and disconnect said drive signal and emitters of said sensor; and

a switch control configured to actuate select ones of said switches.

14. A blood parameter measurement system comprising:

a multiplicity of emitters configured to transmit at least three distinct wavelengths of optical radiation into a tissue site;

at least one detector configured to receive said radiation after attenuation by said tissue site and to generate a corresponding detector signal output; and

a wavelength controller having a drive signal input and a sensor control output adapted to sequentially enable said emitters.

15. The blood parameter measurement system according to claim 14 wherein said wavelength controller selects said emitters in pairs, each of said emitters enabled according to said drive signal.

16. The blood parameter measurement system according to claim 14 wherein said at least one detector comprises a plurality of detectors, each of said detectors selectable by said wavelength controller.

17. The blood parameter measurement system according to claim 14 wherein said wavelength controller comprises an output multiplexer that selectively routes said drive signal to said emitters.

18. The blood parameter measurement system according to claim 14 wherein said wavelength controller comprises a plurality of switches that connect said drive signal to said emitters.

19. The blood parameter measurement system according to claim 14 wherein said wavelength controller further comprises a switch control that selectively actuates said switches.

20. A blood parameter measurement method comprising the steps of:  
communicating a drive signal from a monitor to a sensor;  
synchronizing said sensor with said monitor;  
sequentially enabling a plurality of emitters of said sensor; and  
communicating a sensor signal from said sensor to said monitor.

21. The blood parameter measurement method according to claim 20 wherein said synchronizing step comprises the substeps of:

inputting said drive signal to a wavelength controller; and  
decoding a header interval of said drive signal so as to detect a sync event.

22. The blood parameter measurement method according to claim 20 wherein said enabling step comprises the substeps of:

selecting a predetermined first emitter pair of said sensor in response to said sync event;  
routing said drive signal to said first emitter pair; and  
activating said first emitter pair during a drive interval of said drive signal.

23. The blood parameter measurement method according to claim 22 wherein said enabling step comprises the further substeps of:

deactivating said first emitter pair;  
selecting a predetermined second emitter pair to follow said first emitter pair;  
routing said drive signal to said second emitter pair; and  
activating said second emitter pair during a drive interval of said drive signal.

24. The blood parameter measurement method according to claim 20 wherein said communicating step comprises the substeps of:

selecting a predetermined detector corresponding to a selected emitter pair of said sensor; and

connecting said detector to pinouts of said sensor.

25. A blood parameter measurement system comprising:

a multiple wavelength sensor means for illuminating a tissue site with at least three wavelengths and detecting a corresponding tissue site response;

a software upgrade means for enabling a pulse oximetry monitor to drive said sensor and process a corresponding sensor signal; and

a wavelength controller means for interfacing between said software upgrade means and said multiple wavelength sensor means.

26. The blood parameter measurement system according to claim 25 wherein said software upgrade means comprises:

a sampling controller means for generating an encoded drive signal; and

a signal processing means for demodulating said sensor signal.

27. The blood parameter measurement system according to claim 26 wherein said wavelength controller means comprises a sync decoder means for synchronizing with said software upgrade means in response to said encoded drive signal.

28. The blood parameter measurement system according to claim 25 wherein said wavelength controller means comprises a sensor control means for routing a drive signal from said monitor to a selected one of a plurality of sensor emitters.